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July 3, 1995

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JUL - 3 1995

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF SECRETARY

William F. Caton  
Acting Secretary  
Federal Communications Commission  
1919 M Street, NW  
Washington, DC 20554


Re: CC Docket No. 92-297, RM-7872, RM-7722  
Ex Parte Presentation

Dear Mr. Caton:

The undersigned representative of Hughes Communications Galaxy, Inc. met on June 30, 1995 with Thomas S. Tycz, Donna Bethea and Karl A. Kensinger of the International Bureau to discuss band segmentation proposals for the 28 GHz band. In addition, the enclosed materials are being delivered to these individuals today.

An original and two copies of this letter are enclosed. Copies of this letter are being provided simultaneously to Mr. Tycz, Ms. Bethea and Mr. Kensinger.

Respectfully submitted,

  
John P. Janke

Enclosures

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## **Assessment of LMDS RF Equipment Start up Costs due to**

### **a Non-contiguous Spectrum Allocation**

**Stanford Telecom**

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The following analysis was prepared at the request of Latham & Watkins, counsel to Hughes Communications Galaxy, Inc. This assessment has determined that the Local Multipoint Distribution Service (LMDS) RF equipment start-up cost is not affected by a non-contiguous Ka band (27.5 to 30.0 GHz) spectrum allotment.

Stanford Telecom has become intimately familiar with the LMDS system as reflected in the January 30, 1995<sup>1</sup> and the March 1, 1995<sup>2</sup> Hughes Communications Galaxy FCC filings. In this second filing, the RF equipment costs were surveyed; and the High Power Amplifier (HPA) was determined to be the most expensive RF system component (approximately 10 times the cost of any other RF component). Furthermore, the HPA cost was estimated to be approximately 25% of the RF cell site start up cost (includes labor, warranty and dual redundant equipment).<sup>3</sup>

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<sup>1</sup> See "Review of the Propagation Characteristics in the 28 and 40 GHz Frequency Bands for LMDS Applications," prepared by Stanford Telecom, in Comments of Hughes Communications Galaxy, Inc. to ET Docket No. 94-124, RM-8308, dated January 30, 1995.

<sup>2</sup> See "Assessment of Relative Performance and Costs between LMDS in the 28 and 40 GHz Bands: LMDS is viable in the 40 GHz Frequency Band," prepared by Stanford Telecom, in Reply comments of Hughes Communications Galaxy, Inc. to ET Docket No. 94-124 RM-8308, dated March 1, 1995.

<sup>3</sup> Pages 19 through 24 of footnote 2.

Wireless cable HPAs have been designed as broad band devices which operate from 27.5 to 30.0 GHz; in fact, Thomson and Varian both have a wide band Ka band (27.5 to 30.0 GHz) HPA which transmits over 100W for wireless cable applications. Since this RF component is a broad band device (2.5 GHz), a non-contiguous spectrum allotment within this 2.5 GHz band would not require additional HPAs or HPA modification for non-contiguous LMDS service within the 27.5 to 30.0 GHz spectrum.

In the European Multichannel Multipoint Distribution Service (MMDS), cell sites have two possible RF configurations. For a tower site, two HPAs are implemented for cell site transmission. For a roof-top site, single channel solid state power amplifiers are implemented for cell site transmission.<sup>4</sup> For a single channel power amplifier LMDS configuration, non-contiguous spectrum allotment would have absolutely no cost increase since each channel has its own power amplifier within the Ka band for either a contiguous or non-contiguous spectrum allotment.

Since the HPA is by far the most expensive piece of RF equipment and since its cost is not impacted by a non-contiguous spectrum allotment, a cost impact to other RF equipment, such as the receiver subscriber unit, would be minimal if any at all. LMDS RF equipment was developed for broad band

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<sup>4</sup> Page 5 of footnote 2.

applications, not narrow band applications. The LMDS RF equipment must already operate over a 1 GHz bandwidth. Increasing the bandwidth for the low cost RF equipment to 1.5 GHz would cause slight if any cost increase. Endgate Technology corporation was consulted for other RF equipment costs since Endgate is developing receiver subscriber units and RF cell site equipment. Moreover, Endgate has participated in the FCC filing procedures.<sup>5</sup> According to Executive Vice President Doug Lockie (and author of Endgate FCC filing), "Non-contiguous spectrum allotment has no substantial cost impact to either the subscriber unit or the cell site hub. Furthermore, two way communication becomes easier with non contiguous spectrum allocation." Two equal spaced non-contiguous spectrum bands, such as the suggested spectrum allotment from the combined Boeing, Hughes, Teledesic, and Texas Instruments FCC filing<sup>6</sup>, is a benefit to a full duplex LMDS system. One band is for transmit while the other band is for receive. The separation between the two bands improves isolation which makes signal filtering easier and cheaper.

In summary, a non-contiguous spectrum allocation causes no cost increase to the LMDS system, and is a benefit for some LMDS system configurations.

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<sup>5</sup> Comments of Endgate Technology Corporation, to ET Docket No. 94-124, RM 8303, dated January 30, 1995, presented by Arant Fox.

<sup>6</sup> See Further Comments of The Boeing Company, Hughes Communications, Inc., Teledesic Corporation, and Texas Instruments, Inc. CC Docket No. 92-297, dated May 12, 1995.